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**NISHIKAWA HISAO**

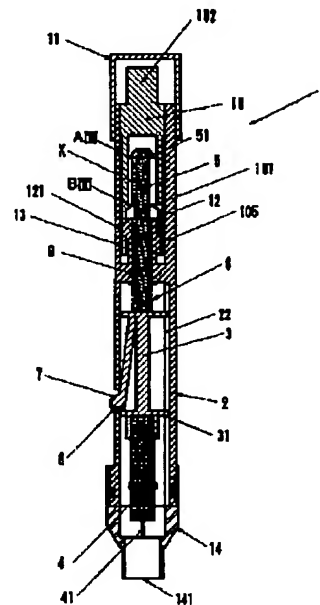
(54) **PUNCTURE APPLIANCE**

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a puncture appliance which has a mechanism for regulating the puncture depth of a lancet simple in manipulation and collects body fluid, such as blood.

SOLUTION: This puncture appliance 1 is capable of controlling the movement of the lancet 14 having a puncture needle 41 and a plunger 3 connected thereto by contacting of a stopper side movement suppression mechanism 51 of a stopper 5 and a regulation mechanism side movement suppression mechanism 101 of a regulation mechanism 10 and is capable of regulating the movement stop position of the lancet 4 and the plunger 3 connected thereto by regulating the position of the regulation mechanism 10 in an axial direction.

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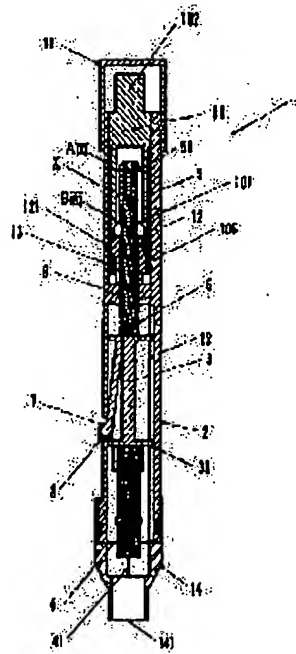
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## LEGAL STATUS

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[Kind of final disposal of application other than

the examiner's decision of rejection or  
application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's  
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2. \*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

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DRAWINGS

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[Drawing 4]

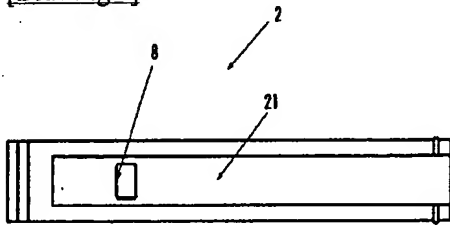


図4

[Drawing 5]

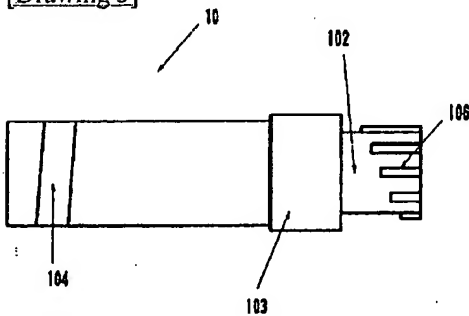


図5

[Drawing 10]

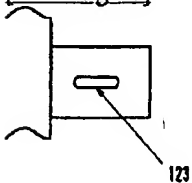


図10

[Drawing 1]

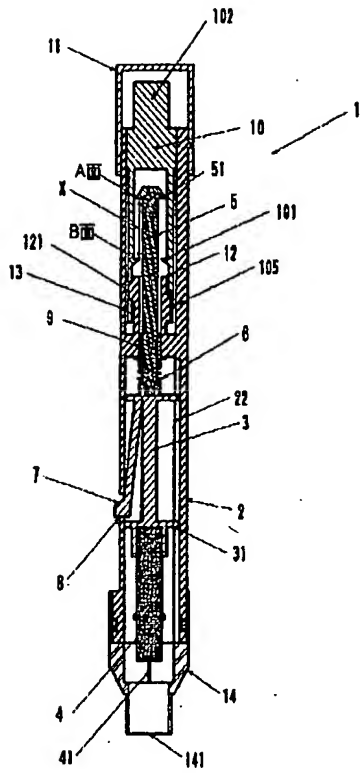
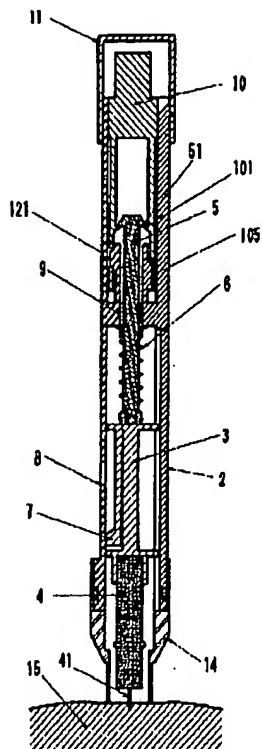


Fig. 1

[Drawing 2]



2

[Drawing 3]

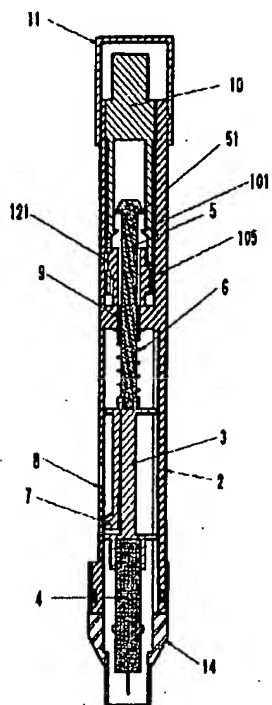


FIG 3

[Drawing 6]

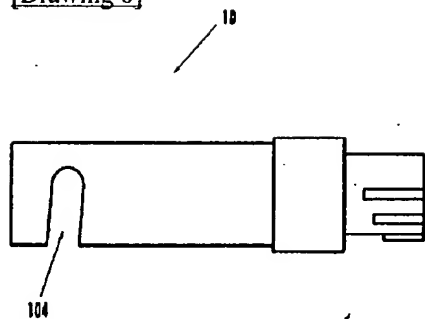


FIG 6

[Drawing 7]

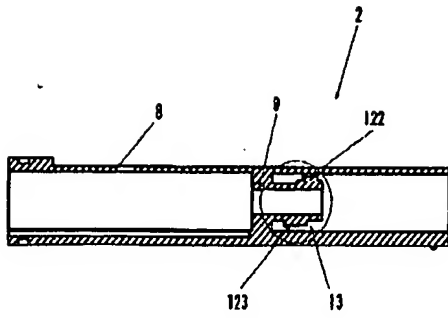


FIG 7

[Drawing 8]

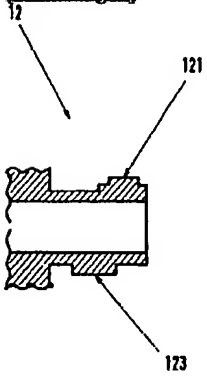


FIG 8

[Drawing 11]

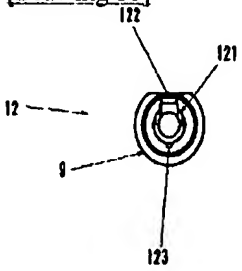


FIG 11

[Drawing 9]

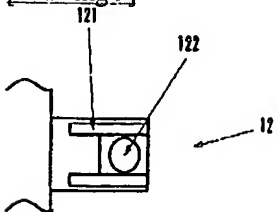


FIG 9





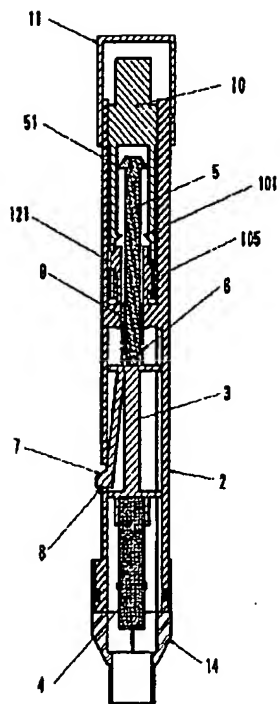


FIG 13

[Drawing 14]

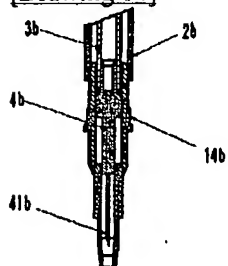


FIG 14

[Translation done.]

## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the reusable puncture instrument for stabbing a fingertip etc. with a reusable puncture needle and extracting the body fluid of an initial complement by making the body fluid in the case of carrying out the clinical test of body fluid etc. into the extraction method.

[0002]

[Description of the Prior Art] The self-blood sugar measurement which acts as the monitor of the change of the daily blood sugar level of a patient itself with the increase in a diabetic in recent years has been recommended. As for the method of extracting the blood for carrying out blood sugar level measurement, the reusable puncture instrument for blood collecting equipped with Lancet of the shape of the shape of a needle or a scalpel is used. To those by whom a puncture is done, it stabs with Lancet of the reusable puncture instrument for blood collecting, and extraction of blood cuts it open at the skin, and is performed by collecting blood the blood which flows out of the incision section after incision to the test paper or a pipet. The reusable puncture instrument for blood collecting is adjusting the puncture depth from adjusting the puncture depth by exchanging the cap of \*\*\*\*\* and \*\*\*\*\* , for example by dashing the end face of a reusable puncture needle against a cap to the diabetic patient being distributed over an adult, an old man, a male, a woman, and it from infants at many races, and the thickness of the skin changing with each. In order to solve an above-mentioned trouble, in WO 97/04707 or the U.S. patent 5613978th, the function in which the puncture depth of Lancet can be arbitrarily adjusted to the cap element of a puncture implement point is offered.

[0003]

### [Problem(s) to be Solved by the Invention]

However, since it had adjustment of the puncture depth in the cap section in such a conventional reusable puncture instrument, there was a problem that a possibility of changing a setup of the puncture depth accidentally was during use, such as the time of

removal of a reusable puncture needle. Furthermore, once it removed the cap, there was a problem whose operation increases at the time of handling that a reusable puncture needle must be set. Moreover, since the puncture depth was adjusted by dashing the end face of a reusable puncture needle against a cap, when a reusable puncture needle bumped into a cap, the shock got across to the reusable puncture needle at the time of a puncture soon, and there was fear of the increase in the ache by blurring of a reusable puncture needle.

[0004]

### [Problem(s) to be Solved by the Invention]

It is in offering the reusable puncture instrument which has a means for preventing that this invention is equipped with the mechanism in which the depth of the puncture of a multi-stage story is adjusted in view of the above-mentioned technical problem, and an adjustment function rotates accidentally and a setup of the depth of a puncture changes. Moreover, this invention is to offer the reusable puncture instrument which can mitigate the shock which gets across to a reusable puncture needle at the time of a puncture. Furthermore, this invention can remove a reusable puncture needle the whole cap section, and in case it is removal of a reusable puncture needle, it aims at offering the reusable puncture instrument which reduced the complicatedness of operation of once removing a cap.

[0005]

[Means for Solving the Problem] The above-mentioned purpose is solved by the following this inventions.

(1) Housing with which opening of the point is carried out in the instrument with which this invention carries out the puncture of a living body's front face, The plunger which Lancet in which the reusable puncture needle prolonged in the direction of a nose of cam was prepared is attached, and slides on the inside of the aforementioned housing, The adjustment mechanism which contacts the stopper connected in the direction of the back end of the aforementioned plunger, and the aforementioned stopper, It connects with the aforementioned plunger or the aforementioned stopper. Aforementioned Lancet, It consists of a spring for punctures made to move the aforementioned plunger and the aforementioned stopper in the direction of a nose of cam of the aforementioned housing. The engagement section is prepared in the aforementioned housing inside. to at least one of aforementioned Lancet, the

aforementioned plunger, or the aforementioned stoppers By engaging with the aforementioned engagement section, preparing the stop section which stops aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper in the first position, and canceling engagement in the aforementioned engagement section and the aforementioned stop section, with the aforementioned spring After aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper move in the direction of a nose of cam from the first position of the above, when the aforementioned stopper contacts the aforementioned adjustment mechanism It is the reusable puncture instrument characterized by stopping movement of aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper in the second position.

[0006] (2) this invention is a reusable puncture instrument given in the above (1) which is what adjusts the second position of the above by [ which center the aforementioned adjustment mechanism on a longitudinal shaft within the aforementioned housing ] carrying out axial rotation.

(3) this invention is the reusable puncture instrument of the above (1) which is what adjusts the second position of the above, or the publication by (2) by [ which center the aforementioned adjustment mechanism on a longitudinal shaft within the aforementioned housing by the salient which moves along with Mizouchi of the shape of an aforementioned spiral prepared in the spiral slot established in either the aforementioned adjustment mechanism or the aforementioned housing, and another side ] carrying out axial rotation.

[0007] (4) It has the connection which this invention is fixed by the aforementioned housing in the aforementioned housing, and is prolonged in the direction of the same axle. By the spiral slot which the aforementioned adjustment mechanism fits in so that the aforementioned connection may be covered, and was established in either the aforementioned adjustment mechanism or the aforementioned connection, and the salient which moves along with Mizouchi of the shape of an aforementioned spiral prepared in another side By [ which center the aforementioned adjustment mechanism on a longitudinal shaft within the aforementioned housing ] carrying out axial rotation, it is a reusable puncture instrument the above (1) which is what adjusts the second position of the above, or given in (3).

(5) this invention is a reusable puncture instrument the above (1) which the aforementioned connection is a tube-like object and is that to which a stopper slides on the interior, or given in (4).

(6) this invention is a reusable puncture instrument the above (1) to which 1 or two or more slits which are prolonged in longitudinal shaft orientations are prepared in a part for the tubed part of the aforementioned adjustment mechanism, or given in (5).

[0008] (7) this invention by [ to which the aforementioned adjustment mechanism leaves a non-inserted portion, is inserted into the aforementioned housing from the back end section of the aforementioned housing, and centers the aforementioned non-inserted portion on a longitudinal shaft ] carrying out axial rotation The aforementioned adjustment mechanism is a reusable puncture instrument the above (1) to which axial rotation centering on a longitudinal shaft is carried out within the aforementioned housing, and covering which protects the aforementioned non-inserted portion is further formed in the back end section of the aforementioned housing, or given in (6).

(8) A part of aforementioned adjustment mechanism [ at least ] of this invention is tubed, and the aforementioned stopper is a reusable puncture instrument the above (1) which slides on the interior of tubed of the aforementioned adjustment mechanism and by which the aforementioned stopper's move inhibition mechanism is prepared for either [ either / both sides or ] the aforementioned interior of tubed, and the aforementioned stopper, or given in (7).

[0009] (9) The aforementioned move inhibition mechanism is prepared for the both sides of the aforementioned interior of tubed, and the aforementioned stopper, and this invention is a reusable puncture instrument the above (1) which is each-other the salient which carries out a stop, or given in (8).

(10) In case this invention adjusts the second position of the above to the aforementioned adjustment mechanism and the aforementioned housing by [ which center the aforementioned adjustment mechanism on a longitudinal shaft ] carrying out axial rotation, it is a reusable puncture instrument the above (1) which has the fixed means of the aforementioned adjustment mechanism in the second position of the above set up beforehand, or given in (9).

[0010] (11) this invention is a reusable puncture instrument the above (1) which is a fitting means by the heights by which the aforementioned fixed means was prepared in either the aforementioned adjustment mechanism or the aforementioned housing, and the crevice in which another side was established, or given in (10).

(12) this invention is a reusable puncture instrument the above (1) which has the space which can permit the aforementioned bending, or given in (11), when the aforementioned stopper contacts the aforementioned adjustment mechanism in the aforementioned housing and the aforementioned adjustment mechanism produces bending to a longitudinal shaft and a perpendicular direction.

[0011] (13) this invention is a reusable puncture instrument the above (1) to which it has the shaft-orientations slot prolonged in longitudinal shaft orientations in the aforementioned housing, and the salient which moves along with aforementioned shaft-orientations Mizouchi is prepared in the aforementioned plunger, or given in (12).

(14) this invention is a reusable puncture instrument the above (1) attached in the aforementioned plunger in the state where it was contained in the aforementioned cap, or given in (13), when aforementioned Lancet covers the aforementioned reusable puncture needle, and is contained possible [ movement to longitudinal shaft orientations ] in the cap who can connect with the point of the aforementioned housing and connects the aforementioned cap to the point of the aforementioned housing.

[0012]

[Embodiments of the Invention] An example is explained to the form of operation of the reusable puncture instrument of this invention in detail with reference to a drawing. In case the reusable puncture instrument 1 which shows the cross section to drawing 1 mainly carries out minute amount extraction of the body fluid, such as blood, from a living body's front face, it is used. The plunger 3 to which a reusable puncture instrument 1 slides on the housing 2 and housing 2 interior, Lancet 4 which has the reusable puncture needle 41 which is attached in the point of a plunger 3 and is prolonged at a nose of cam, The adjustment mechanism 10 which contacts the stopper 5 connected in the direction of the back end of a plunger 3, and a stopper 5, It consists of a spring 6 for punctures for moving a plunger 3, Lancet 4, and a stopper 5 in the direction of a nose of cam.

The engagement section 8 is formed in the housing 2 aforementioned inside, and the stop section 7 which engages with a plunger 3 with the engagement section 8, and stops a plunger 3, Lancet 4, and a stopper 5 in the first position is formed.

[0013] In addition, the state which the state before the first position carries out the puncture of a living body's front face is said, and specifically shows it in drawing 1 is said.

[0014] it is still like [ although especially the configuration will not be limited if housing 2 is a tubed thing as shown in drawing 1 / when the ease of grasping is taken into consideration / a cylinder object is desirable and ] drawing 4 which shows a flat surface around the engagement section 8 -- since engagement in the stop section 7 and the engagement section 8 which will be later mentioned if it has the what flat-surface section 21 can perform easily only by [ not coming and sliding the flat-surface section 21 on a finger ] viewing release, it is desirable

[0015] Although connected, compressed and inserted in the spring standing ways 9 for punctures by which the end was prepared in the spring 6 for punctures by the plunger 3, and the other end was prepared in it by housing 2 inside, it is not necessary to limit to this form in this invention, an end connects with Lancet 4 or a stopper 5, and the other end may be fixed to the inside of the direct housing 2. Moreover, that what is necessary is just that to which a plunger 3, Lancet 4, and a stopper 5 can be moved from the first position to the second position, the springs 6 for punctures may be things, such as a tabular, and do not limit especially the quality of the material to the thing of the shape of a coil which shows a configuration in drawing etc., either. In addition, the spring 6 for punctures is in the state where it was compressed in the first position.

[0016] In addition, although the second position means the position where a reusable puncture needle 41 carries out the puncture of a living body's front face, the state where the point of a reusable puncture instrument 1 to the reusable puncture needle 41 can carry out the puncture of the front face of the living body which pressed the point of not only the projected state but the reusable puncture instrument 1 on the surface of the living body, and rose in the point etc. is included.

[0017] Although the stop section 7 is formed in the plunger 3, it is not necessary to limit it to this form in this invention, and it may be prepared for Lancet 4 or a stopper 5. You may be the

configurations where the configuration does not fix an end to plunger 3 grade, either, and fixes ends to plunger 3 grade, such as the shape of the shape of U character, and V character. Namely, what is necessary is to be able to stop a plunger 3, Lancet 4, and a stopper 5 by the engaged thing with the engagement section 8 in the first position, to carry out movable, and just to be able to cancel engagement in the engagement section 8. Moreover, when the engagement section 8 mentioned later is what is penetrated from the inside of housing 2 to external surface, the stop section 7 is desirable when what the part has projected to the external surface of housing 2 through the engagement section 8 takes into consideration operation of canceling engagement.

[0018] Although the engagement section 8 will not be limited especially if it is prepared in housing 2 inside and can engage with the stop section 7, it is desirable that it is the hole penetrated from the inside of the housing 2 as shown in this operation form to external surface. Thereby, it is the stop section 7 and engagement certainly, and engagement can be easily canceled by pushing in the stop section 7.

[0019] A stopper 5 is connected in the direction of the back end of a plunger 3, and the stopper side move inhibition mechanism 51 is formed. The stopper side move inhibition mechanism 51 engages with the adjustment mechanism side move inhibition mechanism 101, and stops the plunger 3, Lancet 4, and the stopper 5 which moved from the first position in the second position. In addition, with this operation form, although the stopper side move inhibition mechanism 51 and the adjustment mechanism side move inhibition mechanism 101 are convex mutually, it is not necessary to limit them especially and they may be that whose another side one side is convex and is a concave, and the thing of structure which a bore or an appearance changes to shaft orientations gradually mutually, and gears in the shape of a taper. Moreover, a stopper 5 does not need to consider as a plunger 3 and another member, as shown in this operation form, and he may be united with a plunger 3.

[0020] With a stopper 5, since Lancet 4 is separated from the stopper 5, the shock which gets across to Lancet when a plunger 3, Lancet 4, and a stopper 5 stop from the first position in the second position can be decreased. That is, without a shock joining direct Lancet, when Lancet has direct movement suppressed like before, a reusable

puncture instrument 1 can separate from an operator's hand by the shock, puncture operation can sway, or it can prevent giving pain to those who have body fluid extracted etc.

[0021] A tubed thing is specifically raised that what is necessary is just that to which the adjustment mechanism 10 can move the inside of housing 2 to shaft orientations as shown in drawing 1, and a stopper 5 can slide on the interior. Moreover, the adjustment mechanism side move inhibition mechanism 101 mentioned above is formed in the adjustment mechanism 10. Furthermore, as for the adjustment mechanism 10, it can be desirable to have the non-inserted portion 102 to housing 2, and the power at the time of carrying out axial rotation of the adjustment mechanism 10 by this can be transmitted.

[0022] In order for the non-inserted portion 102 to prevent moving from the position which the adjustment mechanism 10 set up by the operation mistake, to be covered by the protective cover 11 is desirable. In addition, a protective cover 11 has the structure where the non-inserted portion 102 cannot be rotated, and the desirable thing which consists of the quality of the material, unless an operator means the thing which can be removed at the time of operation of the non-inserted portion 102, or the thing which has the flexibility which can gather the non-inserted portion 102 and can carry out axial rotation.

[0023] In this operation form, the adjustment mechanism 10 has the structure where drawing 5 and its flat surface are shown for a transverse plane in drawing 6. That is, the spiral slot 104 is established in the periphery. The salient 122 prepared in the connection 12 mentioned later moves relatively along the interior in this slot 104.

[0024] Moreover, in this operation form, the adjustment mechanism 10 is prolonged in the direction of the back end from drawing 7 which shows the cross section containing housing 2, and the spring standing ways 9 for punctures in which the expanded cross section was further prepared by housing 2 inside as shown in drawing 8, and is established by fitting into the connection 12 which is tubed [ to which a stopper 5 can slide on the interior ].

[0025] A connection 12 has the heights 123 for fixation shown in the salient 122 shown in drawing 11 which shows drawing 9 which shows a flat surface, and left-hand side, and drawing 10 which shows a base. If salient 122 carries out axial rotation of the adjustment mechanism 10, it will move

relatively in the inside of a slot 104, and will move the adjustment mechanism 10 to longitudinal shaft orientations. Consequently, the second position of plunger 3 grade can be adjusted. The heights 123 for fixation can fix the state of the adjustment mechanism 10 in the second position of the plunger 3 grade, alias engagement, which was boiled and was set up more nearly beforehand as the crevice 105 established in the inside of the adjustment mechanism 10. In addition, the heights 123 for fixation do not necessarily need to be located in a vertical angle with salient 122, and may be prepared not only in a piece place but in two or more places.

[0026] Here, the relation between the adjustment mechanism 10 and a stopper 5 is described concretely. The moving range from the first position to the second position of stopper 3 grade is indicated to be the position of the longitudinal direction of the adjustment mechanism 10 according to the distance X (shown in drawing 1) of the Ath page (shown in drawing 1) of the stopper side move inhibition mechanism 51, and the Bth page (shown in drawing 1) of the adjustment mechanism side move inhibition mechanism 101. The state where the moving range from the first position to the second position is small is shown in drawing 12, and the state where the moving range from the first position to the second position is large is shown in drawing 13. Here, the position of the longitudinal direction of the adjustment mechanism 10 is determined by the position of the salient 122 of the connection 12 in the spiral slot 104 of the adjustment mechanism 10 by carrying out axial rotation of the adjustment mechanism 10. That is, Distance X is adjusted by carrying out axial rotation of the adjustment mechanism 10, and can be determined.

[0027] Furthermore, the relation between the crevice 105 established in the inside of the adjustment mechanism 10 and the heights 123 for fixation prepared in the connection 12 is described concretely. For example, the difference of the position of the longitudinal shaft orientations of the spiral slot 104 of the adjustment mechanism 10 (with a large state, the moving range from the first position to the second position) If the moving range from the first position to the second position sets the difference of a small state to 1mm and a crevice 105 is established in the inside of the adjustment mechanism 10 at five regular intervals (it is a 45 angle interval to the supporting point about the longitudinal direction medial axis of a reusable puncture instrument 1), Distance X can be adjusted every 0.25mm per stage. Moreover, the difference of the position of the longitudinal shaft orientations of

the spiral slot 104 of the adjustment mechanism 10 (with a large state, the moving range from the first position to the second position) The moving range from the first position to the second position sets the difference of a small state to 1mm, and to the inside of the adjustment mechanism 10, if the longitudinal direction medial axis of a reusable puncture instrument 1 is set as the supporting point at the position of zero angle, 18 degrees, 54 degrees, 108 degrees, and 180 degrees, at it a crevice 105 Distance X can also be adjusted to 0.1mm, 0.2mm, 0.3mm, 0.4mm, and the set points not at equal intervals but arbitrary.

[0028] In addition, if the mark 106 is formed in the non-inserted portion 102, since the set point which the adjustment mechanism 10 is going to adjust can be viewed, it is desirable.

[0029] As for a connection 12, it is desirable to have 1 or two or more slits 121 which are prolonged in longitudinal shaft orientations. By forming a slit 121, when the stopper side move inhibition mechanism 51 and the adjustment mechanism side move inhibition mechanism 101 contact, bending by the inside produced in the adjustment mechanism 10 can be permitted. It becomes possible to mitigate vibration produced in the whole reusable puncture instrument 1 when the stopper side move inhibition mechanism 51 and the adjustment mechanism side move inhibition mechanism 101 contact by this, and a reusable puncture instrument 1 can separate from an operator's hand by vibration, puncture operation can sway, or it can prevent giving pain to those who have body fluid extracted etc.

[0030] Furthermore, the adjustment mechanism 10 is connectable by connecting the adjustment mechanism 10 through a connection 12, forming space 13 between the external surface from the adjustment mechanism side move inhibition-mechanism 101 neighborhood to the direction of a nose of cam, and a housing inside, even if there are few adjustment mechanisms 10, as shown in drawing 1.

[0031] Space 13 can permit bending by the outside produced in the adjustment mechanism 10, when the stopper side move inhibition mechanism 51 and the adjustment mechanism side move inhibition mechanism 101 contact. It becomes possible to mitigate vibration produced in the whole reusable puncture instrument 1 when the stopper side move inhibition mechanism 51 and the adjustment mechanism side move inhibition mechanism 101

contact like the time of this forming a slit 121 in the connection 12 mentioned above, and a reusable puncture instrument 1 can separate from an operator's hand by vibration, or the pain given to those who have body fluid extracted can be prevented. In addition, by forming the almost same outer-diameter section 103 as the bore of housing 2 in the adjustment mechanism 10, even if there is space 13, axial rotation of the adjustment mechanism 10 can be carried out stably.

[0032] In addition, in this invention, the position of the adjustment mechanism 10 is adjusted by necessarily not forming a connection 12, preparing the salient which corresponds to salient 122 at the inside of housing 2, or the external surface of the adjustment mechanism 10, and the spiral slot applicable to the slot 104 spiral on another side, and carrying out axial rotation of the adjustment mechanism 10 -- you may be

[0033] To the point of housing 2, it is desirable to form a cap 14. When plunger 3 grade is in the first position, it has structure out of which a reusable puncture needle 11 does not come, and is made to attach neither a hand nor a finger accidentally out of a cap by this. Especially the mounting arrangement of a cap 14 and housing 2 is not limited, but fitting or screwing by screw structure is raised so that it can remove easily. In addition, what is necessary is to form opening 141 in the contact surface with cap's 14 living body's front face, and just to set the diameter as 1mm or more about 6mm or less preferably 1mm or more 10mm or less so that a puncture can be performed without limiting a puncture part.

[0034] Moreover, a form like cap 14b which shows the cross section for the point is raised to drawing 14 as form with another cap. That is, cap 14b contains Lancet 4b which can slide on the interior and connects reusable puncture needle 41b to an end. By this cap 14b, by connecting cap 14b to housing 2b, the other end of Lancet 4 can be connected to a plunger 3, and it can be used like explanation of use of this operation form mentioned later.

[0035] In this operation form, it is desirable to blur in the shaft-orientations slot 22 and a plunger 3, and to form the prevention salient 31 in the inside of housing 2. When the blurring prevention salient 31 moves along the inside of the shaft-orientations slot 22, a plunger 3 becomes movable [ shaft orientations ] in the state where it was stabilized without blurring in an axial hand of cut, and, as a result, can carry out

the puncture of the reusable puncture needle 41 to an exact position.

[0036] Especially concerning the quality of the material of each component part mentioned above, it is not limited but the \*\*\*\* use of a rigid plastic, the metal, etc. can be carried out. However, even if there are few plungers 3, the sliding surface with a plunger 3 at least has the quality of the material of the thermoplastic elastomer of a sliding surface with housing 2 inside, or housing 2 which can maintain the airtightness of a sliding surface, rubber, etc. to a desirable bird clapper. In case a plunger 3 returns in the first position direction from the second position after press the point of housing 2 on the surface of a living body and carrying out the puncture of a living body's front face with a reusable puncture needle 41 by maintaining airtightness, the space which the point closed on the front face of the living body in housing 2 and a plunger 3 form will be in a reduced-pressure state, and the body fluid which, as a result, attracts and extracts a living body's front face can attract effectively. Moreover, a suction means is established beforehand, space which the point closed on the front face of the living body in housing 2 and a plunger 3 form is made into a reduced pressure state, the puncture of the front face of the living body which rose to housing 2 inboard as a result can be carried out with a reusable puncture needle 41, and the body fluid to extract can also be attracted effectively.

[0037] In case a plunger 3 moves to the second position, the space which the point closed on the front face of the living body in housing 2 and a plunger 3 form may serve as a positive pressure, and it may stop in addition, being able to carry out the puncture of it, in order to draw in, after carrying out the puncture of a living body's front face. Therefore, although the air in the housing 2 used as the positive pressure is missed out of housing 2, in order not to make the open air flow in the housing 2 which was decompressed, things for which the directional valve is prepared in any one of housing 2, a plunger 3, and the caps 14 on the other hand, such as a duckbill valve, are desirable.

[0038] Next, use of this operation form is explained. First, an operator removes a protective cover 11 first, rotates the adjustment mechanism 10, and sets up in the second position of the plunger 3, Lancet 4, and the stopper 5 which can extract body fluid, such as necessary minimum blood, to measurement, i.e., the travel of a reusable puncture needle 41, himself. It enables this to press down the ache by which it is accompanied at the time of a



puncture to necessary minimum. Since it is not necessary to reset it up frequently once it sets up the adjustment mechanism 10, by covering by the protective cover 11, there is nothing and things can perform that the puncture depth is changed by the operation mistake and a reusable puncture needle is deeply stuck by it more than required, a blood collecting mistake, etc.

[0039] Next, the plunger 3 which the point of a plunger 3 was equipped with Lancet 4 which has a reusable puncture needle 41, and the elastic force of the spring 6 for punctures was resisted, and was equipped with Lancet 4 is pushed in in the direction of the back end, and the marginal part of the engagement section 8 is made to stop the stop section 7. At this time, the spring 6 for punctures is held in the state of compression. In this state, preparation of the puncture to a living body's front face is completed (refer to drawing 1 ).

[0040] And it pushes so that it may stick to the front face of a living body like a fingertip, and the stop section 7 which projected from the engagement section 8 is pushed for the opening 141 at a cap's 14 nose of cam. Then, engagement in the stop section 7 and the engagement section 8 is removed, the contracted spring 6 for punctures develops by the elastic force, a plunger 3 moves in the direction of a nose of cam, and a reusable puncture needle 41 projects from a cap's 14 opening 141, and carries out the puncture of a living body's front face 15 (refer to drawing 2 ). At this time, a stopper 5 slides on the inside of housing 2 together with a plunger 3, when a stopper's 5 stopper side move inhibition mechanism 51 contacts the adjustment mechanism side move inhibition mechanism 101 of the adjustment mechanism 10, movement in the direction of a nose of cam of a plunger 3 is regulated, and the depth of the puncture of the front face of the living body by the reusable puncture needle 41 of Lancet 4 is simultaneously adjusted to the set-up depth. After a reusable puncture needle 41 carries out the puncture of a living body's front face, it returns to natural length through attenuation movement, a reusable puncture needle falls out from a living body's front face, and the spring 8 for punctures is stored in housing 2 (refer to drawing 3 ).

[0041] Thus, other than a puncture, Lancet 4 projects and bends, is like, cannot damage the skin etc. accidentally from the opening 141 of a cap's 14 point, and can prevent infection etc., and a reusable puncture instrument 1 becomes what has high safety. A stopper 5 and the adjustment mechanism 10 can

perform the puncture to a predetermined puncture position with sufficient repeatability.

[0042]

[Effect of the Invention] Since the reusable puncture instrument of this invention is equipped with the mechanism in which the puncture depth of Lancet is adjusted, it becomes possible [ pressing down the ache which an operator can set up himself and is accompanied by the puncture depth which can take necessary minimum blood volume to measurement at the time of a puncture to necessary minimum ].

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#### CLAIMS

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[Claim(s)]

[Claim 1] It has the following and the engagement section is prepared in the aforementioned housing inside. to at least one of aforementioned Lancet, the aforementioned plunger, or the aforementioned stoppers By engaging with the aforementioned engagement section, preparing the stop section which stops aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper in the first position, and canceling engagement in the aforementioned engagement section and the aforementioned stop section, with the aforementioned spring After aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper move in the direction of a nose of cam from the first position of the above, when the aforementioned stopper contacts the aforementioned adjustment mechanism The instrument which carries out the puncture of a living body's front face characterized by stopping movement of aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper in the second position. Housing with which opening of the point is carried out. The plunger which Lancet in which the reusable puncture needle prolonged in the direction

of a nose of cam was prepared is attached, and slides on the inside of the aforementioned housing. The stopper connected in the direction of the back end of the aforementioned plunger. The spring for punctures which connects with the adjustment mechanism which contacts the aforementioned stopper, and the aforementioned plunger or the aforementioned stopper, and is made to move aforementioned Lancet, the aforementioned plunger, and the aforementioned stopper in the direction of a nose of cam of the aforementioned housing.

[Claim 2] The reusable puncture instrument according to claim 1 which is what adjusts the second position of the above by [ which center the aforementioned adjustment mechanism on a longitudinal shaft within the aforementioned housing ] carrying out axial rotation.

[Claim 3] It has the connection which is fixed by the aforementioned housing in the aforementioned housing and is prolonged in the direction of the same axle. By the spiral slot which the aforementioned adjustment mechanism fits in so that the aforementioned connection may be covered, and was established in either the aforementioned adjustment mechanism or the aforementioned connection, and the salient which moves along with Mizouchi of the shape of an aforementioned spiral prepared in another side The reusable puncture instrument according to claim 1 to 2 which is what adjusts the second position of the above by [ which center the aforementioned adjustment mechanism on a longitudinal shaft within the aforementioned housing ] carrying out axial rotation.

[Claim 4] It is the reusable puncture instrument according to claim 1 to 3 with which the aforementioned adjustment mechanism leaves a non-inserted portion, and is inserted into the aforementioned housing from the back-end section of the aforementioned housing, the aforementioned adjustment mechanism carries out axial rotation centering on a longitudinal shaft within the aforementioned housing by [ which center on a longitudinal shaft in the aforementioned non-inserted portion ] carrying out axial rotation, and covering protect the aforementioned non-inserted portion is further formed in the back-end section of the aforementioned housing.

[Claim 5] It is the reusable puncture instrument according to claim 1 to 4 with which a part of aforementioned adjustment mechanism [ at least ] is tubed, the aforementioned stopper slides on the interior of tubed of the aforementioned

adjustment mechanism, and the aforementioned stopper's move inhibition mechanism is prepared for either [ either / both sides or ] the aforementioned interior of tubed, and the aforementioned stopper.

[Claim 6] The reusable puncture instrument according to claim 1 to 5 with which 1 or two or more slits which are prolonged in longitudinal shaft orientations are prepared in a part for the tubed part of the aforementioned adjustment mechanism.

[Claim 7] The reusable puncture instrument according to claim 1 to 6 which has at least one or more fixed meanses of the aforementioned adjustment mechanism in the second position of the above set up beforehand in case the second position of the above is adjusted to the aforementioned adjustment mechanism and the aforementioned housing by [ which center the aforementioned adjustment mechanism on a longitudinal shaft ] carrying out axial rotation.

[Claim 8] The reusable puncture instrument according to claim 1 to 7 attached in the aforementioned plunger in the state where it was contained in the aforementioned cap when aforementioned Lancet covers the aforementioned reusable puncture needle, and is contained possible [ movement to longitudinal shaft orientations ] in the cap who can connect with the point of the aforementioned housing and connected the aforementioned cap to the point of the aforementioned housing.

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